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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,638	09/15/2003	Jiro Hiraiwa	242742US3	8007
22850	7590	08/20/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER ZHENG, LOIS L	
			ART UNIT 1793	PAPER NUMBER
			NOTIFICATION DATE 08/20/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/661,638

**Applicant(s)**

HIRAIWA ET AL.

**Examiner**

LOIS ZHENG

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8, 10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/5508)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of Claims***

1. Claims 1-2 are amended in view of applicant's amendment filed 21 April 2008. Claims 9 and 11 are canceled in view of applicant's amendment. Therefore, claims 1-8, 10 and 12 are currently under examination.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-8, 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/77412, whose corresponding US Patent is Tojo et al. US 6,518,105 B2(Tojo'105), in view of Marumo et al. US 4,790,859(Marumo), and further in view of JP2000-160390 (JP'390).

Tojo'105 teaches a fluorine gas generator for generating high purity fluorine gas by electrolysis of a mixed molten-salt comprising hydrogen fluoride(abstract). The fluorine gas generator of Tojo'105 comprises an electrolytic cell which is separated into an anode chamber and a cathode chamber(abstract, Fig. 1 numerals 5 and 7).

Tojo'105 further teaches that the fluorine gas generator comprises absorption towers to downstream from the hydrogen and fluorine gases outlet to remove excess HF from the hydrogen gas and the fluorine gas(col. 6 lines 14-19). Fig. 1 of Tojo'105 appears to shown that the fluorine gas generator has box-shaped body.

However, the absorption towers of Tojo'105 do not explicitly read on the claimed first and second adsorption units. In addition, Tojo'105 does not explicitly teach the claimed at least three compartments for housing the electrolyzer and the adsorption units or the claimed second and third compartments directly adjacent to the first compartment.

Marumo teaches an apparatus for separating gaseous mixtures containing a first and a second gas having different chemical compositions(abstract). The gas separation apparatus of Marumo teaches using two adsorption towers to provide an efficient separation of a gas mixture(col. 2 lines 41-42, col. 11 lines 53-55). Marumo further teaches that the first adsorption tower is being used to separate the gas mixture while the adsorbent in the second adsorption tower is being regenerated. Later on, the process is switch where the second adsorption tower is used to separate the gas mixture while the adsorbent in the first adsorption tower is being regenerated(col. 12 lines 6-63).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the gas mixture separation apparatus of Marumo with the dual adsorption tower setup into the fluorine gas generator of Tojo'105 to remove the HF from the hydrogen gas and the fluorine gas in order to achieve efficient separation of the gas mixture as taught by Marumo and to minimize the adsorption tower down time by using one adsorption tower for gas separation while allowing the adsorbent regeneration to take place in the other adsorption tower as taught by Marumo.

JP'390 teaches separating the control system and the electroplating cell in separate rooms and the oxygen and hydrogen gases are also discharged in these separate rooms to avoid potential hazardous or unsafe conditions due to cross-contamination(paragraph [0045, 0057]). In addition, JP'390 does not require that the separate rooms for housing the control system and the electroplating cell to be located away from each other. Therefore, the examiner considers two rooms located right next to each other with a shared wall within the scope of JP'390's invention.

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the multi-room housing of JP'390 into the apparatus of Tojo'105 in view of Marumo to separately house the electrolyzer, the equipments used to process the hydrogen gas product including the first adsorption unit and the equipments used to process the fluorine gas product including the second adsorption unit in order to avoid cross contamination as taught by JP'390 (abstract, paragraph [0017]).

Regarding claims 1-2, including the amended feature, one of ordinary skill in the art would have also found it obvious to put the hydrogen and fluorine gas product processing equipments, including the first and second adsorption units, in separate rooms on each side of and adjacent to the room for housing the electrolyzer as taught by Tojo'105 in view of Marumo and JP'390, since both sets of gas product processing equipments are directly downstream from the anode and cathode chambers and such housing arrangement would minimize the piping required to transport the gas products to respective adsorption units. Therefore, the first housing for electrolyzer as taught by Tojo'105 in view of Marumo and JP'390 is located between the second housing for the

first adsorption unit as taught by Tojo'105 in view of Marumo and JP'390 and the third housing for the second adsorption unit Tojo'105 in view of Marumo and JP'390 so that the second and the third housing are not in contact with each other as claimed.

Regarding claim 3, Tojo'105 further teaches an exhaust opening(Fig. 1 numeral 19) to provide controlled atmosphere for the interior of the fluorine gas generator(col. 8 lines 16-18). Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated an exhaust opening(i.e. suction opening) to each of the three compartments of the fluorine gas generator in order to provide a controlled interior atmosphere in each of the electrolyzer and the hydrogen and fluorine gas post-treatment processing sections.

Regarding claim 4, Tojo'105 further teaches a buffer tank(Fig. 1 numeral 44) and a pressurizer(Fig. 1 numeral 42). Even though the buffer tank(i.e. reservoir means) and the pressurizer of Tojo'105 are located outside of the box-shaped housing instead of within the second compartment as claimed and the pressurizer of Tojo'105 locates upstream of the buffer tank instead of downstream from the buffer tank as claimed, one of ordinary skill in the art would have found the claimed reservoir and pressurizer locations obvious since it is well settled that rearrangement of parts is an obvious matter of design choice. In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). In addition, the buffer tank and the pressurizer of Tojo'105 differs from the instant invention only in their locations, which is unpatentable because shifting the locations of the buffer tank and the pressurizer of Tojo'105 would not have modified the operation of the buffer tank and the pressurizer. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). See

MPEP 2144.04. Furthermore, it would have been obvious to one of ordinary skill in the art to have incorporated the buffer tank and the pressurizer of Tojo'105 in view of Marumo and JP'390 inside the same compartment for post-treatment of fluorine gas discharge(i.e. second compartment) in order to protect the buffer tank and the pressurizer from potentially hazardous environment and conditions.

Regarding claim 5, Tojo'105 teaches that a heater is used to provide proper heating of the electrolytic cell and the heater make take any form(col. 6 lines 53-67). Even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach that the heater is water heating device as claimed, one of ordinary skill in the art would have found it obvious to have used an water heating device in the heater of Tojo'105 in view of Marumo and JP'390 since an water heating device is an well known low cost heating device.

Regarding claim 6, even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach that the electrolyzer is mounted on a transporting member, one of ordinary skill in the art would have found it obvious to have mounted the electrolytic cell of Tojo'105 in view of Marumo and JP'390 on a transporting member capable of moving the electrolytic cell in and out of the fluorine gas generator in order to allow easy access to the electrolytic cell for routine maintenance such as cleaning and replacement of parts.

Regarding claims 7-8, the adsorption unit of Tojo'105 in view of Marumo and JP'390 comprises two adsorption columns and can be operated alone as claimed. In addition, even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach

that the adsorption columns are mounted on transporting members as claimed, one of ordinary skill in the art would have found it obvious to have mounted the adsorption columns of Tojo'105 in view of Marumo on transporting members capable of moving the adsorption columns in and out of the first and second compartments in order to allow easy access to the adsorption columns for routine maintenance such as cleaning and replacement of parts.

Regarding claims 10 and 12, the multi-room housing as taught by Tojo'105 in view of Marumo and JP'390 reads on the claimed box-shaped body formed as a unit based on the broadest reasonable interpretation.

***Response to Arguments***

4. Applicant's arguments filed 21 April 2008 have been considered but are not persuasive.

Applicant argues that JP'390 only teaches using two separate rooms for the electroplating device and the control system to void contamination and does not teach the three separate compartments setup arranged as recited as claims 1-2. Applicant further argues that JP'390 is not directed to providing separate housing for isolating electrolyzer and other units as claimed.

The examiner's response to similar arguments as discussed in paragraph 5 of the previous Non-Final Office Action is incorporated herewithin. As discussed in the previous Non-Final Action, the concept of separately housing the major component of an electrolysis unit to avoid cross-contamination is shown in JP'390. The examiner believes that it would have been within the skills of one of ordinary skill in the art to



derive from the teachings of JP'390 and implement additional housing to isolate other equipments of an electrolyzer unit to avoid cross-contamination. In addition, JP'390 teaches that product gases such as oxygen and hydrogen are connected separately in each of the two rooms for safety purposes. Therefore, one of ordinary skill in the art would have learned the concept of separating the product gases produced from an electrolytic process in order to improve safety by avoiding mixing of the product gases.

Regarding applicant's argument relating to the positioning of the three housing compartments, the examiner withdrawn the obviousness argument based on MPEP 2144.04. However, the rejection ground is still deemed proper based on the combined teachings of Tojo'105 in view of Marumo and JP'390 and the obviousness analysis as set forth in paragraph 3 above.

Applicant's remaining remarks are directed to the advantages of applicant's invention. However, such discussion does not specifically points out what distinguishes applicant's fluorine gas generator from the fluorine gas generator of the prior art.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOIS ZHENG whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/  
Supervisory Patent Examiner, Art  
Unit 1793

Application/Control Number: 10/661,638  
Art Unit: 1793

Page 10

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**Application Number****Application/Control No.**

10/661,638

**Examiner**

LOIS ZHENG

**Applicant(s)/Patent under  
Reexamination**

HIRAIWA ET AL.

**Art Unit**

1793